28 MAR 1964

MEMORANDUM FOR: Director of Central Intelligence

SUBJECT: Letters of Commendation

1. This memorandum contains a recommendation in paragraph 6 for your action.

2. As you will recall, the Purcell Panel last year came to certain conclusions on the CORONA/MURAL system and made appropriate recommendations. A limited analysis by the DD/S&T staff indicated that the Purcell Panel may not have had sufficient data to draw a proper conclusion. This staff study indicated the necessity for a very careful evaluation of the factors which prevented the CORONA/MURAL system from providing maximum resolution at all times. It was then decided that we should form a true working group composed of the best technical brains available to look into this question in some detail. We were very fortunate in securing the services of Dr. Sidney Drell to act as Chairman and we assigned [redacted] of the DD/S&T as his full time project assistant. 25X1

3. The Drell Panel was charged with the responsibility of looking into those factors which were limiting the CORONA/MURAL system. The D/NRO stated that he expected to use this information to provide for appropriate changes to the CORONA/MURAL system and to provide background information for the development of other and newer systems. The Drell Committee was charged not to get into the subject of hardware in this respect.

4. As Dr. Drell and [redacted] got further into this subject with their technical experts, it became painfully clear we had a very complicated inter-related scientific problem on our hands and that the short study without benefit of experimental results would not answer all our questions. 25X1

[redacted] 25X1

Copy 7 of 7 25X1

In spite of the large amount of effort devoted to aerial reconnaissance, this is the first time that the physics of the image quality were ever studied in a meaningful way.

5. It is the general consensus that this Panel quite successfully analyzed the complicated technical interrelationships and pointed out the important factors involved. The necessary further experiments which are required were also indicated. The success of the Drell Panel is due primarily to the dynamic leadership of Dr. Drell who undertook the task at considerable inconvenience to his personal plans. Also, much of the success is due to the very competent full time staff support that he received from [redacted] 25X1 of the DD/S&T Office of Research and Development. 25X1 [redacted] accomplished this while still acting as the Deputy Assistant Director of the Office which is, as you know, in the throes of formation.

6. The contribution of these two gentlemen to the success of the Drell Panel is of such a magnitude as to warrant a letter of appreciation from you. Truly, they have both performed beyond that which is normally expected of very competent individuals. I therefore recommend that you sign the two letters of commendation which are attached.

[redacted] 25X1

ALBERT D. WHEELON
Deputy Director
(Science and Technology)

Attachments
2 Letters of Commendation

Distribution
Copy 1 and 2 - Addressee
3 - DD/S&T
4 - ADD/S&T
5 - EO/DD/S&T
6 and 7 - DD/S&T Files

25X1

O/DD/S&T:EDGiller [redacted] (26 Mar 64)

25X1

SATELLITE PROGRAM 66-R-546 Chron 6
(System Improvement)

25X1 Wheelon to D/NRO (McMillan) [redacted] 5 Nov 1963

Analysis of the resolution distribution of CORONA photography by CIA, prompted by the Purcell Group report, showed that the quality spread is much broader than anyone had expected. Furthermore, this spread cannot be aacounted for by a straightforward error analysis of known effects. It is now apparent that we have a great deal to learn about the basic limitations on the quality of satellite photography, especially that produced by the COR area search system. One must understand the basic cause of this degradation before one can improve the system or design a significantly improved follow-on system.

CIA continuing inquiry begun under COR improvement study.

~~22~~ McCone and Gilpatric on 22 Oct agreed that CIA/DDS&T shld establish a research group to explore whole range of engineering and physical limitations on satellite photography using best national resources.

CIA will convene a Satellite Photography Working Grp to work on immediate question of system improvement and long term problems fundamental to design of future systems.'

Working party to convene at NPIC, where most of work will be done, on 13 Nov 63.

Fund activity out of CIA funds in regular DDS&T research budget, but hope to be reimbursed out of FY 64 NRO funds. Planning figure [redacted] adequate for first three months. 25X1

Purcell Committee

Dr. Edward Purcell, Physicist, Stanford Univ., Chairman

DRELL PANEL

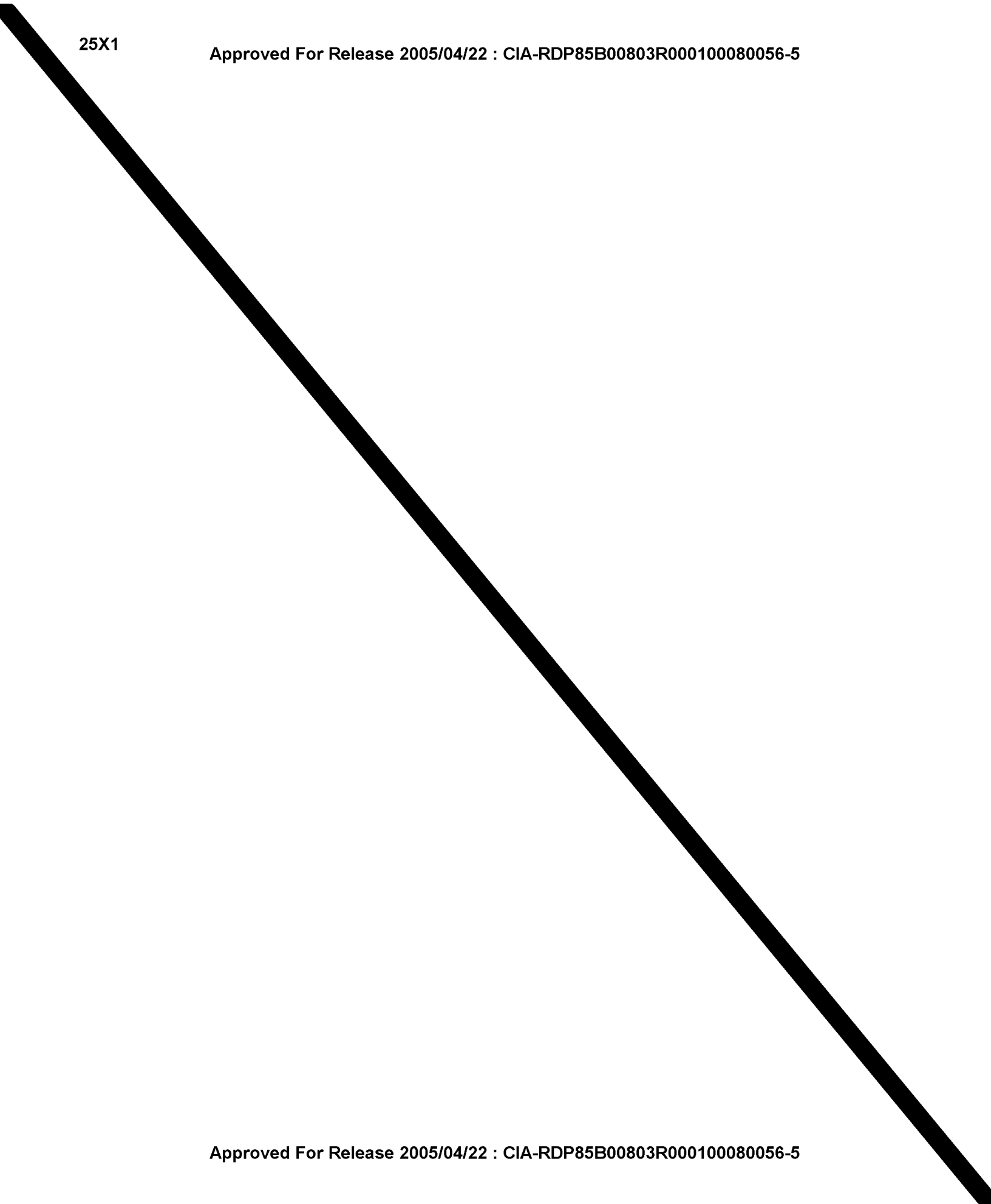
The Photo Working Panel was established for the following reason: A preliminary analysis of the product of a particular overhead recon system had indicated that a wide variation in the quality of the product existed. This variation in product quality was a good deal wider than might have been anticipated due to normal statistical variations in operating conditions and system components. Hence the question arose as to the existence of unrecognized factors which adversely influenced product quality.

In late 1963 the PWP was established to address itself to the aforementioned problem. The basic background data is summarized in a letter from ADW to McMillan 5 Nov 63. PSP was formally established under provisions of a memo 18 Nov 63 by Gen Carter. (Its function solely advisory to CIA)

First meeting 13 Nov 63, last 8 Feb 64, when report submitted. (9 formal sessions ea 2-3 days)

The Panel operated under constraints: from an ex post facto examination of the product of a recon system, to identify and ameliorate, if possible, significant causes of system performance degradation. It was quickly determined that no satisfactory objectivw and quantitative measure of product image quality existed. Attention was focused, accordingly, on two candidate techniques. The first, edge gradient analysys, in theory allowed the determination of system modulation transfer functions from an analysis of microdensitometer tracings across edges (runway, bldgs etc) existing in product photography. The second, GEMS (graded estimated measuring samples) involved subjective comparison of opnl photog against a carefully prepared library of standards of known quality.

Conclusions and recommendation contained in final report
Briefly, (a) work continue toward construction of an objective and quantitative measure of image quality.
(b) an inflight and ground measurement program be implemented to obtain engineering data to check on system performance in the opnl environment.
(c) More emphasis be placed on engineering passes of opnl systems over properly designed domestic, ground based targets.



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